

■ Object Detection Model Evaluation Report

Model: SSD300 with VGG16 Backbone

- Pre-trained Weights: torchvision.models.detection.ssd300_vgg16
- Dataset: Pascal VOC 2007 (Validation set)
- Evaluation Framework: torchmetrics.detection.MeanAveragePrecision
- Sample Size: 20 images (limited for low-memory environments)

Evaluation Metrics

- mAP: 0.0000
- Precision: -1.0000
- Recall: 0.0000

Note: Results are based on a limited evaluation subset to ensure compatibility with low-memory systems. Full dataset evaluation may show improved metrics if detection works correctly.

👉 ■ Experience Report

■ What I Did

- Implemented an object detection pipeline using SSD300 with VGG16 backbone.
- Used Pascal VOC 2007 validation split for evaluation.
- Evaluated using MeanAveragePrecision from torchmetrics, limited samples due to constraints.

■ Challenges Faced

- Memory issues caused Colab kernel crashes; limited evaluation to 1 image at a time (20 total).
- Parsing Pascal VOC annotations from XML was difficult.
- Model inference returned no correct detections, resulting in zero scores.

■ Use of AI Tools

- Used ChatGPT for debugging memory issues, optimizing code, and drafting reports.
- Used AI to explore evaluation techniques with torchmetrics.

■ What I Learned

- Structure of object detection pipelines using pre-trained models.
- Parsing Pascal VOC annotation format.
- Calculating mAP, precision, recall with torchmetrics.

■ What Surprised Me

- Evaluation metrics are sensitive to label mismatches or missing detections.
- Pre-trained models can fail without proper preprocessing/label alignment.

■ Coding & AI Balance

- AI used for low-level bug fixes and optimization.
- Manual control of architecture, data parsing, and evaluation logic.

■ Suggestions to Improve Assignment

- Recommend small backbones (e.g., MobileNet) for low-resource systems.
- Provide sample annotation parsers.
- Allow simplified datasets for first evaluations.
- Add label mapping tips to avoid zero-score confusion.

Prepared by: Rohith Thokala

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